

What is claimed is:

1. An optical microswitch for use with a laser beam that extends along a path comprising a body having an inlet port adapted to receive the laser beam and a plurality of outlet ports, a plurality of mirrors carried by the body, a plurality
5 of micromotors carried by the body, attachment means for coupling the plurality of mirrors to the respective plurality of micromotors whereby the micromotors selectively move the mirrors from a first position out of the path of the laser beam to a second position into the path of the laser beam to direct
10 the laser beam to one of the outlet ports, each of the micromotors having at least one electrostatically-driven comb drive assembly therein for moving the respective mirror to one of the first and second positions, and a controller electrically coupled to the micromotors for providing control
15 signals to the micromotors.

2. An optical microswitch as in Claim 1 in combination with a plurality of magneto-optical disc surfaces, a plurality of flying heads and a plurality of output light-carrying elements, each of the flying heads movable over one of the
5 magneto-optical disc surfaces and one of the output light-carrying elements coupled to each of the flying heads.

3. An optical microswitch as in Claim 2 wherein the plurality of magneto-optical disc surfaces includes a stack of magneto-optical discs, each of the magneto-optical discs having at least one magneto-optical disc surface.

4. An optical microswitch as in Claim 2 in which the laser beam is reflected by one of the magneto-optical disc surfaces to produce a reflected laser beam having a polarization rotation, further comprising an optical
5 microassembly carried by the body for measuring the polarization rotation of the reflected laser beam.

5. An optical microswitch as in Claim 1 wherein the plurality of mirrors and plurality of micromotors include a first plurality of mirrors and corresponding micromotors and a second plurality of mirrors and corresponding micromotors, the path of the laser beam extendable between the first plurality of micromotors and the second plurality of micromotors so that the first plurality of micromotors oppose the second plurality of micromotors relative to the path of the laser beam.

6. An optical microswitch as in Claim 5 wherein the first plurality of mirrors and corresponding micromotors are linearly disposed along a first imaginary line and the second plurality of mirrors and corresponding micromotors are linearly disposed along a second imaginary line extending parallel to the first imaginary line and the path of the laser beam.

7. An optical microswitch as in Claim 5 wherein the first plurality of micromotors includes at least two micromotors disposed side by side along a first imaginary line extending perpendicularly of the path of the laser beam and the second plurality of micromotors includes at least two micromotors disposed side by side along a second imaginary line extending perpendicularly of the path of the laser beam.

8. An optical microswitch as in Claim 5 wherein the first and second plurality of mirrors are each inclined to direct the laser beam in a single direction.

9. An optical microswitch as in Claim 5 wherein the plurality of mirrors and plurality of micromotors include a third plurality of mirrors and corresponding micromotors and a fourth plurality of mirrors and corresponding micromotors, the path of the laser beam extendable between the third plurality of micromotors and the fourth plurality of micromotors so that the third plurality of micromotors oppose the fourth plurality of micromotors relative to the path of the

10 laser beam, means including an additional mirror and corresponding additional micromotor for selectively directing the laser beam along a first path extending between the first and second plurality of micromotors and a second path extending between the third and fourth plurality of micromotors.

10. An optical microswitch as in Claim 9 wherein the first and second plurality of mirrors and the third and fourth plurality of mirrors are inclined to direct the laser beam in a single direction.

11. An optical microswitch as in Claim 1 wherein the plurality of mirrors and plurality of micromotors include at least one first mirror and corresponding first micromotor and at least one second mirror and corresponding second micromotor, 5 the path of the laser beam extendable between the at least one first micromotor and the at least one second micromotor so that the at least one first micromotor opposes the at least one second micromotor relative to the path of the laser beam and wherein the plurality of mirrors and plurality of micromotors 10 further include at least one third mirror and corresponding third micromotor and at least one fourth mirror and corresponding fourth micromotor, the path of the laser beam extendable between the at least one third micromotor and the at least one fourth micromotor so that the at least one third 15 micromotor opposes the at least one fourth micromotor relative to the path of the laser beam, means including an additional mirror and corresponding additional micromotor for selectively directing the laser beam along a first path extending between the at least one first micromotor and the at least one second 20 micromotors and a second path extending between the at least one third micromotor and the at least one fourth micromotor.

12. An optical microswitch as in Claim 1 wherein the plurality of micromotors includes a plurality of at least two micromotors disposed side by side along an imaginary line extending perpendicularly of the path of the laser beam.

13. An optical microswitch as in Claim 1 wherein a plurality of at least twelve mirrors and corresponding micromotors are provided for selectively directing the laser beam in a plurality of parallel directions.

14. An optical microswitch as in Claim 1 wherein each mirror comprises a layer of silicon and a layer of a reflective material adhered to the layer of silicon whereby the layer of silicon provides a surface of low roughness and high flatness.

15. An optical microswitch as in Claim 14 wherein each mirror further comprises at least one pair of dielectric layers overlying the layer of a reflective material, said at least one pair of dielectric layers including a first layer of a low dielectric material and a second layer of a high dielectric material.

16. An optical microswitch as in Claim 1 wherein at least one of the micromotors includes travel stop means for limiting the movement of the corresponding mirror at the second position whereby the travel stop means facilitates repeatability in the operation of the optical microswitch.

17. An optical microswitch as in Claim 16 further comprising lead means for electrically connecting the travel stop means to the controller whereby the travel stop means permits the controller to monitor when the mirror is in the second position.

18. A magneto-optical data storage system comprising an input light-carrying element providing a laser beam, a plurality of output light-carrying elements, a plurality of magneto-optical disc surfaces, a plurality of flying heads, each of the flying heads movable over one of the magneto-optical disc surfaces and one of the output light-carrying elements coupled to each of the flying heads and an optical microswitch coupled to the input light-carrying element and to

the output light-carrying elements for selectively directing
10 the laser beam to one of the output light-carrying elements.

19. A magneto-optical data storage system as in Claim 18
wherein the input light-carrying element provides a laser beam
that extends along a path, the optical microswitch including
a body, the input light-carrying element and the plurality of
5 output light-carrying elements coupled to the body, at least
one mirror carried by the body and at least one of micromotor
carried by the body and coupled to the at least one mirror
whereby the at least one micromotor selectively moves the at
least one mirror from a first position out of the path of the
10 laser beam to a second position into the path of the laser beam
to direct the laser beam to one of the output light-carrying
elements.

20. A magneto-optical data storage system as in Claim 19
wherein the at least one micromotor has at least one
electrostatically-driven comb drive assembly therein for moving
the at least one mirror to one of the first and second
5 positions.

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